

NWS FORM E-5 U.S. DEPARTMENT OF COMMERCE NOAA, NATIONAL WEATHER SERVICE	HSA OFFICE: San Juan, PR (SJU)
MONTHLY REPORT OF RIVER AND FLOOD CONDITIONS TO: NATIONAL WEATHER SERVICE HYDROMETEOROLOGICAL INFO CENTER, W/OS31 SSMC 2 – Room 13468 1325 EAST-WEST HIGHWAY SILVER SPRING, MD 20910-3283	REPORT FOR (MONTH / YEAR): August, 2004
	DATE: September 3, 2004
	SIGNATURE: Peter Corrigan
When no flooding occurs, include miscellaneous river conditions, such as significant rises, record low stages, ice conditions, snow cover, droughts, and hydrologic products issued (WSOM E-41).	

Summary: Preliminary data showed that August precipitation was lower than normal over the eastern half of Puerto Rico and somewhat above normal in the west. San Juan ASOS showed August rainfall at 3.49" or 1.73" below the 1971-2000 normal of 5.22". Rainfall at St. Thomas in the U.S. Virgin Islands was 2.50" or 1.00" below the August mean. There was no serious flooding, although numerous Urban and Small Stream Flood Advisories were issued for typical summertime convective events. The majority of these were for the far west and central mountains. Despite a very active month for tropical storms in the Atlantic there was little direct hydrologic impact on the islands.

The first week of August was relatively quiescent, following the trend in July. However, Tropical Storm Alex formed well north of Puerto Rico on the 1st and tropical depression #2 formed south of the island late on the 2nd. It never became well-organized and the attendant weather stayed well to the south. Isolated heavy showers, producing 2 to 3 inches of rainfall around Caguas and near Ponce late on the 2nd prompted Urban/Small Stream Flood Advisories for nine municipalities. Rain gage totals ending 12Z on the 3rd reached 2.72" at Rio Guanajibo near Sabana Grande (ZOBP4); 1.46" at Gurabo 2W (GROP4); 1.37" at Lago Toa Vaca (TOXP4); 1.24" at Rio Gurabo at Gurabo (GURP4) and 1.04" at Rio Tanama near Utuado (UTHP4). Rainfall of 2 to 3 inches in the vicinity of Lares during the afternoon of the 3rd also prompted Flood Advisories for four municipalities in that area. The rain gage at Rio Guajataca at Lares (LARP4) had 2.22", most of which fell in 2 hours. This led to minor flooding on that river (see E-3 report). Several mostly dry days ensued until the 7th, when isolated showers in southeast Puerto Rico during the early nighttime produced some moderate to heavy rainfall. Barrio Marin in Patillas (PARP4) was the only gage site to measure over one inch, picking up 1.41" ending 12Z on 8 August.

A strong tropical wave moving across the Windward Islands early on the 9th strengthened into the third tropical depression of the season during the day and later into Tropical Storm Charley. Meanwhile, precipitation was widely scattered across Puerto Rico on the 9th with a few moderate rain producing showers in the east and far west. Flood advisories were issued for Anasco and Las Marias due to radar estimated rains of 2 to 3.5 inches. The highest gage totals were at Anasco (ANAP4) with 2.01" and San Sebastian (SEBP4), 1.62".

The track of Charley well to the south (south of 14°N) as it passed Puerto Rico on

the 10th precluded any substantial hydrologic impact. Despite highly unstable conditions and fairly high moisture only a few isolated showers affected primarily the south central island and the northeast. The 11th saw very isolated heavy convection affecting the far west, primarily Anasco. Radar estimates of up to 5 inches of rain prompted issuance of an Urban/Small Stream Flood Advisory and Emergency Management reported water over roads 402 and 406 in Anasco.

More widespread shower activity affected the southwest portions of the island on the 12th, primarily in the Rio Grande de Arecibo and Rio Hormigueros basins. Flood Advisories for ten municipalities from Hormigueros eastward through Adjuntas were issued. 24-hour rainfall reached 2.00" at Adjuntas (ADJP4); 1.80" at Hormigueros (MAYP4); 1.79" at Barrio Saltillo (ADSP4); and 1.75" at Adjuntas – Highway 135. No flood reports were received by the NWS. Extremely moist air (12Z PWAT of 2.33") predominated on 13th, but convection was fairly scattered over the far northwest and east central parts of the island. Flood Advisories were issued for 7 municipalities during the afternoon. Quebrada Arenas near San Lorenzo picked up 2.08" of rain for the highest point total. Slow moving showers and thunderstorms affected the area west of San Juan on the 14th, producing radar-estimated rainfall of 1 to 3 inches and requiring a Flood Advisory for eight municipalities. Significant convection on the 15th was confined primarily to the Rio Grande de Anasco basin, where 2 to 4 inches were estimated on radar. Rain gage totals included Lago Guayo near Lares (LLUP4), 2.25"; Rio Casei near Mayaguez (ANAP4), 1.67"; and San Sebastian (SEBP4), 1.54". Tropical Storm Earl, which formed several days earlier, passed well to the south of Puerto Rico on the 15th and actually weakened to a tropical wave early on the 16th as it moved very rapidly across the Caribbean Sea. During the afternoon of the 16th an isolated strong storm over the far west produced substantial urban flooding in portions of Mayaguez and Anasco. Reports of water in a school in Barrio Mani, road flooding in Mayaguez and on Route 2 were received. Radar estimated rainfall in a localized area north of downtown Mayaguez reached 5 to 6 inches in a several hours, although no rain gages were located in the heavy rain area.

Isolated strong convection affected parts of north central Puerto Rico on the 18th as high precipitable water (12Z sounding 2.01") and an unstable air mass combined with an upper level trough over the region. A number of municipalities were put under Flood Advisories and a Flash Flood Warning issued for Arecibo. This was based on radar estimates of 5 to 6 inches in a small area, although rain gage amounts were considerably less. The highest was 2.48" at Rio Tanama (ARDP4), followed by Manati (MANP4), 1.90" and Lago Matrullas (ZDP4), 1.38". No flooding was reported from Arecibo during or after the event. The upper trough persisted into the 19th, albeit under a somewhat drier and more stable regime. Despite this, scattered heavy showers developed across parts of the northeast, west and central mountains. Urban and Small Stream Flood Advisories were issued for 11 municipalities, with the heaviest rains occurring over a small area of northern Villalba and Coamo. WSR-88D radar estimated in excess of 7 inches in 3 hours north of Lago Toa Vaca, while the rain gage at Barrio Apeadero near Villalba (VINP4) had 3.14 during this period. 1.18" fell in 15 minutes from 13:00 to 13:15 local time. The Villalba Alert gage (ZMAP4) had 2.56"; Rio Guajataca at Lares (LARP4) 2.13" and Moca (MOCP4), 2.01". The heavy rains in the Rio Guajataca basin caused the river to briefly exceed flood stage at Lares.

Fairly intense showers across the central mountains and south on the 25th required a Flood Advisories for six municipalities. Rainfall of 3 to 4 inches fell in this area, including 3.78" at both Barrio Saltillo (ADSP4) and Lago Garzas (ADJP4) in Adjuntas. Convection on the 27th was centered over the eastern offshore islands as well as southwest Puerto Rico. Radar estimated rainfall over Vieques reached 6 inches in several hours, requiring a Flood Advisory. Rainfall in the west was

heaviest over the Rio Guanajibo basin, with significant river rises observed at on that river at San German and downstream at Hormigueros. At San German (GSGP4) the river rose from around 4 feet (165 cfs) to 11.43 feet or 4,100 cfs and a Flood Warning was issued for the river at Hormigueros (HORP4), which crested around a foot below flood stage. More strong storms developed over the northwest on the 28th, producing 1 to 2 inches in this area.

Tropical depression six formed over the eastern Atlantic very late on the 24th, became Tropical Storm Frances the next day and strengthened to a Hurricane on the 26th. This storm strengthened as it moved west over the next several days, prompting a Hurricane Watch for the northern U.S. Virgin Islands and Culebra and Vieques early on the 30th. A Tropical Storm Watch for mainland Puerto Rico was issued near midday on the 30th. Extremely dry air in advance of the storm was evident in the 12Z sounding on the 30th, with precipitable water of only 1.03", but a special sounding at 18Z revealed a rapid increase in PW to 2.13". The storm passed roughly 140 miles north of San Juan (position: 20.5°N, 65.9°W) at its closest approach to Puerto Rico on the 31st, and Tropical Storm Warnings were issued by the NHC. In the event however, the tropical storm force winds and heavier rainfall remained well north of the islands. Fast moving storms moved across the island around midday and produced radar estimated amounts of 2 to 3 inches over parts of Guayama, Cayey and Yabucoa, for which an Urban and Small Stream Flood Advisory was issued. Later in the day showers across the offshore islands prompted another Flood Advisory but amounts were less than 2 inches on radar. The highest rain gage amounts were at Lago Carite (CARP4), 2.52"; Yabucoa (YBUP4), 2.33"; Patillas (PATP4), 1.93"; Lago Patillas (PASP4), 1.76" and Aguas Buenas (BZAP4), 1.69".

Non-Routine Hydrologic Products Issued:

Hydrologic Outlooks (SJUESFSJU):	0
Flood Watches (SJUFFASJU):	4
Flood Warnings (SJUFLWSJU):	2
Flash Flood Warnings (SJUFFWSJU):	1
Urban/Small Stream Flood Advisories: (SJUFLSSJU)	109

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